

Application No. 10/608,104
Amendment dated 15 June 2005
Reply to Office Action of 16 March 2005

Page 2 of 20

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in this application:

Listing of Claims:

1. (Currently Amended) A method for determining ~~an operational state of a system for filtering by-products generated during a media imaging operation, the method comprising:~~
collecting the by-products in an airflow;
channeling the airflow through at least one filtration element;
measuring a first flow rate of the airflow in a first location; and,
~~determining the an operational state of the system indicative of a desirability for operator intervention based at least in part on a comparison of the first flow rate to at least one first threshold.~~
2. (Original) A method according to claim 1, comprising measuring a second flow rate of the airflow at a second location spaced apart from the first location.
3. (Original) A method according to claim 2, wherein determining the operational state of the system is based at least in part on a comparison of the second flow rate to at least one second threshold.
4. (Currently Amended) A method according to claim 2, wherein the first location is upstream from the at least one filtration element and the second location is downstream from the at least one filtration element.

Application No. 10/608,104
Amendment dated 15 June 2005
Reply to Office Action of 16 March 2005

Page 3 of 20

5. (Currently Amended) A method according to claim 4, comprising determining an operational state of the at least one filtration element based at least in part on the first and second flow rates.
6. (Original) A method according to claim 2, wherein the first location is upstream from the second location.
7. (Currently Amended) A method according to claim 6, comprising determining an operational state of a portion of the system between the first and second locations based at least in part on at least one of the first and second flow rates.
8. (Currently Amended) A method according to claim 7 46, comprising, in response to determining the operational state of the portion of the system between the first and second locations, signaling a potential existence of a blockage between the first and second locations.
9. (Currently Amended) A method according to claim 7 46, comprising, in response to determining the operational state of the portion of the system between the first and second locations, signaling a potential existence of an airflow leak within the system.
10. (Currently Amended) A method according to claim 7, comprising, in response to determining the operational state of the portion of the system between the first and second locations, signaling that the at least one filtration element requires servicing or replacement.

Application No. 10/608,104
Amendment dated 15 June 2005
Reply to Office Action of 16 March 2005

Page 4 of 20

11. (Currently Amended) A method according to claim 7 46, wherein the first location is proximate the imaging operation, wherein determining the operational state of the portion of the system between the first and second locations [,] comprises comparing the first and second flow rates, and [,] wherein the method comprises, in response to the comparison, signaling a potential existence of at least a partial blockage proximate to the imaging operation.
12. (Original) A method according to claim 1, wherein determining the operational state of the system based at least in part on the comparison of the first flow rate to at least one first threshold comprises identifying a potential existence of at least one of: an airflow blockage in the system and an airflow leak in the system.
13. (Original) A method according to claim 1, wherein determining the operational state of the system based at least in part on the comparison of the first flow rate to at least one first threshold comprises determining whether the filtration element has reached a capacity.
14. (Original) A method according to claim 1, wherein measuring the first flow rate of the airflow in the first location comprises measuring pressure at one or more locations.
15. (Original) A method according to claim 14 wherein measuring the first flow rate comprises measuring a first pressure at a point where the airflow has a first cross-sectional area and a second pressure at a point where the airflow has a second cross-sectional area different from the first cross-sectional area.

Application No. 10/608,104
Amendment dated 15 June 2005
Reply to Office Action of 16 March 2005

Page 5 of 20

16. (Currently Amended) A system for filtering by-products generated during a media imaging operation, the system comprising:
 - a filtration unit having an inlet and an outlet;
 - a collection nozzle coupled to the inlet and locatable proximate to the imaging operation for collecting the by-products;
 - an air mover connected to generate an airflow through the filtration unit and the collection nozzle;
 - a first sensor for generating a first signal indicative of a flow rate of the airflow in a first location; and,
 - a comparator configured to receive the first signal and to compare the first signal flow rate of the airflow in the first location to at least one threshold to determine an operational state of the system indicative of a desirability for operator intervention.
17. (Original) A system according to claim 16, comprising means for communicating an indication of the operational state to a user.
18. (Original) A system according to claim 16, comprising a second sensor for generating a second signal indicative of a second flow rate of the airflow in a second location spaced apart from the first location.
19. (Currently Amended) A system according to claim 18 wherein the comparator is configured to receive the first and second signals and to determine an the operational state of the system based at least in part on both at least one of: the first and second signals flow rate of the airflow in the first location and the second flow rate of the airflow in the second location.

Application No. 10/608,104
Amendment dated 15 June 2005
Reply to Office Action of 16 March 2005

Page 6 of 20

20. (Currently Amended) A system according to claim 19 ~~47~~, wherein the first location is proximate to the collection nozzle and the second location is proximate to the ~~outlet~~ downstream from the first location and the comparator is configured to determine an the operational state of the system, the operational state of the system comprising which comprises at least one of:

- a blockage of the collection nozzle;
- a disconnected conduit between the collection nozzle and the inlet;
- a leak in the system;
- a malfunction of the air mover;
- a filtration element in the filtration unit having reached a predetermined fraction of its capacity; and
- a filtration element in the filtration unit having reached its capacity.

21. (Currently Amended) A system according to claim 19 ~~47~~ wherein the second location is downstream relative to the first location and wherein the comparator is configured to determine an operational state of a portion of the system between the first and second locations, the operational state of the portion comprising at least one of:

- a blockage of the collection nozzle;
- a disconnected conduit between the collection nozzle and the inlet;
- a leak in the system;
- a malfunction of the air mover;
- a filtration element in the filtration unit having reached a predetermined fraction of its capacity; and
- a filtration element in the filtration unit having reached its capacity.

Application No. 10/608,104
Amendment dated 15 June 2005
Reply to Office Action of 16 March 2005

Page 7 of 20

22. (Currently Amended) A system according to claim 16, wherein the sensor system comprises a pressure transducer.
23. (Currently Amended) A system according to claim 16 wherein the first location is in at the collection nozzle.
24. (Currently Amended) A system according to claim 18 wherein the system comprises at least one filtering element located in the airflow between the collection nozzle and the outlet and wherein the first location is in at the collection nozzle and the second location is downstream in the airflow from the at least one filtering element.
25. (Original) A system according to claim 24 wherein the air mover is downstream from the filtering element, and the second location is in a conduit having a progressively decreasing cross-sectional area between the filtering element and the air mover.
26. (Cancelled)
27. (Currently Amended) A method according to claim 26 for determining an operational state of a filtration element used within a system for filtering by-products generated during a media imaging operation, the method comprising:
collecting the by-products in an airflow;
channeling the airflow containing the by-products through the filtration element;
maintaining a count indicative of a remaining capacity of the filtration element in a memory device coupled to the filtration element; and

Application No. 10/608,104
Amendment dated 15 June 2005
Reply to Office Action of 16 March 2005

Page 8 of 20

determining the remaining capacity of the filtration element based at least in part on the count;

wherein the count comprises an indication of an area imaged during imaging operations involving the filtration element and a type of media.

28. (Original) A method according to claim 27 wherein determining the remaining capacity of the filtration element based at least in part on the count comprises multiplying the area imaged during imaging operations involving the filtration element and the type of media and a byproduct generation rate per unit area for the type of media and comparing the result to a maximum capacity of the filtration element.
29. (Currently Amended) A method according to claim 26, comprising: for determining an operational state of a filtration element used within a system for filtering by-products generated during a media imaging operation, the method comprising:

collecting the by-products in an airflow;
channeling the airflow containing the by-products through the filtration element;
maintaining a count indicative of a remaining capacity of the filtration element in a memory device coupled to the filtration element;
determining the remaining capacity of the filtration element based at least in part on the count;
predetermining a by-product generation rate per unit area for a specific media; and
adjusting the count based at least in part on the by-product generation rate and an area imaged during imaging operations involving the specific media.

Application No. 10/608,104
Amendment dated 15 June 2005
Reply to Office Action of 16 March 2005

Page 9 of 20

30. (Currently Amended) A method according to claim 26, comprising: for determining an operational state of a filtration element used within a system for filtering by-products generated during a media imaging operation, the method comprising:

collecting the by-products in an airflow;
channeling the airflow containing the by-products through the filtration element;
maintaining a count indicative of a remaining capacity of the filtration element in a memory device coupled to the filtration element;
determining the remaining capacity of the filtration element based at least in part on the count;
for each of a plurality of different media types, providing a stored corresponding by-product generation rate per unit area; and
for each media type, adjusting the count based at least in part on the by-product generation rate associated with that media type and an area imaged during imaging operations involving that media type.

31. (Original) A method according to claim 30, comprising determining a capacity of the filtration element for a first media type based on an empirically determined capacity of the filtration element for a second media type and known differences between the media by-product generation rates associated with the first and second media types.

32. (Original) A method according to claim 31 comprising filtering by-products from a plurality of different media types imaged in subsequent imaging operations using the same filtration element.

33. (Cancelled)

Application No. 10/608,104
Amendment dated 15 June 2005
Reply to Office Action of 16 March 2005

Page 10 of 20

34. (Currently Amended) A system for filtering an airflow containing imaging by-products, the system comprising:

a filtration unit having an inlet, an outlet and an air mover for generating the airflow between the inlet and the outlet,

a replaceable filtration element located in a path of the airflow between the inlet and the outlet, and the filtration element comprising a memory device coupled to the filtration element for storing information indicative of a remaining capacity of the filtration element.

35. (Original) The system of claim 34 comprising a receptor configured to interface with the memory device.

36. (Original) The system of claim 34, wherein the filtration element comprises a sorbent.

37. (Original) The system of claim 35, wherein the memory device is configured to store information which is indicative of at least one of:

a filtration element type identifier;

a unique filtration element identification number;

a remaining capacity of the filtration element;

a maximum capacity of the filtration element;

an accumulated chronological time indicative of the time during which the filtration element has been installed in the system;

a maximum allowable chronological time; and

an indication of a rate at which a capacity of the filtration element is consumed.

Application No. 10/608,104
Amendment dated 15 June 2005
Reply to Office Action of 16 March 2005

Page 11 of 20

38. (Original) The system of claim 37, wherein the receptor comprises a controller and the controller is configured to use the information stored in the memory device to determine at least one system operational state selected from:

- a filtration element does not match a media that is to be imaged;
- a filtration element has reached a predetermined fraction of its capacity;
- a filtration element has reached its maximum capacity;
- a filtration element has exceeded its shelf life;
- a filtration element is not installed; and
- a filtration element is installed incorrectly.

39. (Currently Amended) A system for filtering imaging by-products produced during an imaging operation, the system comprising:

- means for generating an airflow carrying the by-products;
- means for filtering the airflow to remove the by-products from the airflow;
- means for detecting a flow rate of the air flow; and
- means for determining an operational state of the system indicative of a desirability for operator intervention based at least in part on the detected flow rate.

40. (New) A method according to claim 1 wherein the first location is upstream from the at least one filtration element and the method comprises: measuring a second flow rate of the airflow in a second location downstream from the at least one filtration element and determining an operational state of the filtration element based at least in part on both the first and second flow rates.

Application No. 10/608,104
Amendment dated 15 June 2005
Reply to Office Action of 16 March 2005

Page 12 of 20

41. (New) A method according to claim 40 comprising determining a potential existence of an airflow blockage between the first and second locations based at least in part on both the first and second flow rates.
42. (New) A method according to claim 40 comprising determining a potential existence of an airflow leak between the first and second locations based at least in part on both the first and second flow rates.
43. (New) A system according to claim 16
wherein the first location is upstream from the filtration unit, and
the system comprises at least one filtration element located in the airflow between the collection nozzle and the outlet and a second sensor for generating a second signal indicative of a second flow rate of the airflow in a second location downstream from the at least one filtration element, and
the comparator is connected to receive the first and second signals and is configured to determine an operational state of the at least one filtration element based at least in part on both the flow rate of the airflow in the first location and the second flow rate of the airflow in the second location.
44. (New) A system according to claim 43 wherein the comparator is configured to determine a potential existence of an airflow blockage between the first and second locations based at least in part on both the flow rate of the airflow in the first location and the second flow rate of the airflow in the second location.
45. (New) A method according to claim 43 wherein the comparator is configured to determine a potential

Application No. 10/608,104
Amendment dated 15 June 2005
Reply to Office Action of 16 March 2005

Page 13 of 20

existence of an airflow leak between the first and second locations based at least in part on both the flow rate of the airflow in the first location and the second flow rate of the airflow in the second location.

46. (New) A method according to claim 7, wherein determining the operational state of the portion of the system between the first and second locations is based at least in part on both the first and second flow rates.
47. (New) A system according to claim 19 wherein the comparator is configured to determine the operational state of the system based at least in part on both the flow rate of the airflow in the first location and the second flow rate of the airflow in the second location.
48. (New) A system according to claim 1 wherein the at least one filtration element comprises at least one particulate filter.
49. (New) A system according to claim 16 wherein the filtration unit comprises at least one particulate filter located between the inlet and the outlet.
50. (New) A system according to claim 16 wherein the comparator comprises a controller.
51. (New) A system for filtering by-products generated during a media imaging operation, the system comprising:
 - a filtration unit having an inlet and an outlet;
 - a collection nozzle coupled to the inlet and locatable proximate to the imaging operation for collecting the by-products;
 - an air mover connected to generate an airflow through the filtration unit and the collection nozzle;

Application No. 10/608,104
Amendment dated 15 June 2005
Reply to Office Action of 16 March 2005

Page 14 of 20

a first sensor for generating a first signal indicative of a flow rate of the airflow in a first location; and,

a controller configured to receive the first signal and to compare the flow rate of the airflow in the first location to at least one threshold to determine an operational state of the system indicative of a desirability for operator intervention.